

**Water Softener Pilot Program**

**Proposition 13 Urban Water Conservation Program  
Grant Proposal**

**California Department of Water Resources  
Office of Water Use Efficiency  
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Sacramento, CA 95814  
Attention: Marsha Prillwitz (916) 651-9674**

submitted by

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## Consolidated Water Use Efficiency 2002

### I. Proposal Part One

#### A. Project Information Form

1. Applying for (select one):	<input checked="" type="checkbox"/> (a) Prop 13 Urban Water Conservation Capital Outlay Grant
	<input type="checkbox"/> (b) Prop 13 Agricultural Water Conservation Capital Outlay Feasibility Study Grant
	<input type="checkbox"/> (c) DWR Water Use Efficiency Project
2. Principal applicant (Organization or affiliation):	<u>Santa Clara Valley Water District</u>
3. Project Title:	<u>Water Softener Pilot Program</u>
4. Person authorized to sign and submit proposal:	Name, title <u>Hossein Ashktorab, Water Use Efficiency Unit Manager</u>
	Mailing address <u>5750 Almaden Expressway</u>
	<u>San Jose, CA 95118-3614</u>
	Telephone <u>(408) 265-2600</u>
	Fax. <u>(408) 978-0156</u>
	E-mail <u>hashktorab@valleywater.org</u>
5. Contact person (if different):	Name, title. _____
	Mailing address _____
	_____
	Telephone _____
	Fax. _____
	E-mail _____
6. Funds requested (dollar amount):	<u>\$60,000</u>
7. Applicant funds pledged (dollar amount):	<u>\$43,927</u>
8. Total project costs (dollar amount):	<u>\$103,927</u>
9. Estimated total quantifiable project benefits (dollar amount):	<u>\$120,309</u>

Percentage of benefit to be accrued by applicant:	<u>100%</u>
Percentage of benefit to be accrued by CALFED or others:	<u>100%</u>
10. Estimated annual amount of water to be saved (acre-feet):	<u>5.9 af</u>
Estimated total amount of water to be saved (acre-feet):	<u>117 af</u>
Over <u>20</u> years	<u></u>
Estimated benefits to be realized in terms of water quality, instream flow, other:	<u>Yes</u>
11. Duration of project (month/year to month/year):	<u>7/2002 to 7/2003</u>
12. State Assembly District where the project is to be conducted:	<u>20, 21, 22, 23, 24, 27 and 28</u>
13. State Senate District where the project is to be conducted:	<u>10, 11, 13 and 15</u>
14. Congressional district(s) where the project is to be conducted:	<u>14, 15, 16 and 17</u>
15. County where the project is to be conducted:	<u>Santa Clara County</u>
16. Date most recent Urban Water Management Plan submitted to the Department of Water Resources:	<u>2001</u>
17. Type of applicant (select one): Prop 13 Urban Grants and Prop 13 Agricultural Feasibility Study Grants:	<input type="checkbox"/> (a) city <input type="checkbox"/> (b) county <input type="checkbox"/> (c) city and county <input type="checkbox"/> (d) joint power authority <input checked="" type="checkbox"/> (e) other political subdivision of the State, including public water district <input type="checkbox"/> (f) incorporated mutual water company
DWR WUE Projects: the above entities (a) through (f) or:	<input type="checkbox"/> (g) investor-owned utility <input type="checkbox"/> (h) non-profit organization <input type="checkbox"/> (i) tribe <input type="checkbox"/> (j) university <input type="checkbox"/> (k) state agency <input type="checkbox"/> (l) federal agency
18. Project focus:	<input type="checkbox"/> (a) agricultural <input checked="" type="checkbox"/> (b) urban
19. Project type (select one): Prop 13 Urban Grant or Prop 13 Agricultural Feasibility Study Grant capital outlay project related to:	<input checked="" type="checkbox"/> (a) implementation of Urban Best Management Practices <input type="checkbox"/> (b) implementation of Agricultural Efficient Water Management Practices <input type="checkbox"/> (c) implementation of Quantifiable

Objectives (include QO number(s))

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20. Do the actions in this proposal involve physical changes in land use, or potential future changes in land use?

☐ (a) yes

☒ (b) no

**Proposal Part One**

**A.     *Signature Page***

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form is authorized to submit the proposal on behalf of the applicant;  
and

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name and title

\_\_\_\_\_  
Date

## **Consolidated Water Use Efficiency 2002**

### **II. Proposal Part Two**

#### ***Project Summary***

This study builds on existing studies co-funded by CALFED designed to identify the impacts of older water softeners. Through detailed tracking of our customer surveys in the last several years, SCVWD has identified approximately three hundred customers using older inefficient water softeners. These customers will serve as a test-bed to assess the types of outreach programs and incentive offers required to best effectuate market transformation to efficient softening technology. The pilot program will set the stage for an expanded program in the future that is more efficient and effectively targeted.

A rebate of up to 300 dollars (\$200 average) will be offered to customers who agree to either: (1) replace their older water softener for newer and more efficient water softener technology; (2) remove their older water softener for a non-regenerating water filter; or (3) replace their older water softener with one using centralized off-site regeneration. With an increasing customer concern about finished water quality, it is important for water agencies to work with the point-of-use treatment industry to improve the efficiency and mitigate negative effects of less than optimal implementation of water softening technology.

In addition to the promotion of rebates to customers that have already been identified as possessing older water softening technology (through historical customer surveys), this program also proposes a component of outreach and information for the benefit of retail distributors of water softeners. This outreach component will not only inform distributors of the existence of rebates for customers possessing and using inefficient water softeners; it will also provide informational brochures on the advantages of potassium chloride as an alternative ion-exchanger. (Potassium softened water not only does not harm plants, it provides an important nutritional component for plants.) The informational brochure will contain a CALFED funded coupon for a complimentary bag of “environmentally friendly” potassium chloride.

Both the rebate component and the outreach/information component are designed to tie into ongoing research on the difficulties introduced by sodium added by water softeners. In addition to internal monitoring and evaluation, SCVWD has designed this program to maximize synergies with the CALFED cosponsored national study of the contribution of water softeners to the sodium loading in urban effluent water and salinity management in general.

The total cost of the program, including in-kind contributions from agencies is \$103,927. The total benefit to participating agencies is \$120,000 with 117 acre-feet of water savings. This proposal requests \$60,000 in grant funding.

## **A. *Scope of Work: Relevance and Importance***

### **1. Nature, Scope, And Objectives Of The Project.**

The groundwater basin in the Santa Clara Valley Water District service area is characterized as hard to very hard, and some areas have high levels of total dissolved solids (TDS). This has resulted in large numbers of customer installed water softening devices in particular areas. Residential surveys completed by SCVWD and its agencies have confirmed the prevalence of water softening. In particular, the detailed tracking of residential surveys over the last several years has allowed us to distinguish the water softeners that regenerate the exchange bed based on a periodic timer from the newer technology water softeners that regenerate on an as needed basis. The water softening technology developed more recently is also intrinsically more efficient—requiring a lower volume of regenerate water in addition to lower levels of salt consumption.

Overall, the objectives of the project are to contribute to CALFED, state, regional, and local conservation goals by:

- ?? Implementing a water softener conservation program
- ?? Serving as a test bed for identifying the most effective implementation program designs
- ?? Characterizing applicability of the results to other regions in California
- ?? Considering adoption of water softeners as a BMP or PBMP
- ?? Reducing demand for water imported from the Bay-Delta ecosystem
- ?? Reducing dissolved solids in wastewater treatment plant inflows and groundwater
- ?? Evaluating the conservation benefits and costs from regional, local agency and retail customer perspectives
- ?? Evaluating implementation successes and failures and, in so doing, improve design of future programs throughout California

### **2. Statement of Critical Water Issues.**

This project is strongly needed because the Bay-Delta ecosystem is stressed in terms of the balance between supply and demand, water quality in surface and groundwater, salt water intrusion, and habitat management. It has become increasingly clear that careful planning is needed to avoid and mitigate problems surrounding salinity management as well as supply.

Although there have been major recent advances in the efficiency of water conditioning equipment, there is little awareness of the existence or benefits of the new technologies among the relevant customer populations. Agencies have little experience in promoting these technologies in a cost effective manner and they have not studied where their most strategic opportunities lie. Further, pilot programs with State support provide models of interagency cooperation that is especially important to addressing issues that go beyond water supply alone.

Water, wastewater, groundwater, environmental, and planning agencies need to work in a coordinated fashion to effectively address issues such as salinity and contaminant management. This project will have several important positive impacts on the Bay-Delta ecosystem:

- ?? Replacing old water softeners will reduce demand for water imported from the Bay-Delta to urban water agencies.
- ?? Replacing old water softeners will reduce the introduction of TDS, detergents, and other cleaning compounds into wastewater flows and potentially to ground and surface water supplies that are part of the Bay-Delta ecosystem.
- ?? New water softeners are also more energy efficient, saving the Bay-Delta ecosystem an increment of environmental damage resulting from energy production and distribution.
- ?? Developing cost-effective programs to reduce TDS and other contaminants will speed the introduction of these technologies and their benefits to the Bay-Delta watershed at large.
- ?? Develop information on the most cost-effective means to maximizing point-of-use water softener efficiency. For example, how are the device settings optimized for local water quality conditions? How does plumbing configuration improve efficiency? These lessons will also benefit all areas of California that rely on the Bay-Delta.

This project is consistent with the CALFED objectives in that it:

- ?? Contributes to water quality by reducing TDS, detergents, and other contaminants
- ?? Reduces demand allowing for improvements in habitat and ecosystem functions
- ?? Generally reduces the mismatch between Bay-Delta water supply and demand

The project is consistent with other state, regional, and local conservation planning activities:

- ?? Urban Water Management Plans. Water softeners can contribute to achieving water savings, including peak-season savings.
- ?? MOU and BMPs. This program generally contributes to the MOU conservation objectives. It is an example of a technological development that provides great potential for developing Potential Best Management Practices 2 and 3. It may also contribute toward modifying BMP 1 – Residential Water Surveys.
- ?? Local groundwater basin management plans would be supported by efficient water and salt use because it reduces contaminants in wastewater flows to sewers and septic systems, reducing sources of salinity loading to the groundwater basin.
- ?? SCVWD Integrated Water Resources Plan. This plan seeks to put conservation measures on equal footing with supply measures to meet the region's water needs. This can only be defensible if reliable and measurable savings can be determined.

## ***B. Scope of Work: Technical/Scientific Merit, Feasibility, Monitoring, and Assessment***

### **1. Methods, Procedures, and Facilities**

This pilot program is targeted at overcoming institutional and customer hurdles toward the retrofit of inefficient water softener devices. This study builds on existing studies co-funded by CALFED designed to identify the impacts of older water softeners. Through detailed tracking of customer surveys in the last several years, SCVWD has identified customers using older inefficient water softeners. These customers will serve as a test-bed to assess the types of outreach programs and incentive offers required to best effectuate market transformation to efficient softening technology.

### **2. Task List and Schedule**

Task 1: Assess feasibility of alternative program designs.

Contact and work with industry marketing groups:

- ?? Assess existing marketing materials, identify informational shortcomings, pretest new customer information packets;
- ?? Interview staff and contractors who implemented San Jose Water Company's joint marketing of efficient water softeners; and
- ?? Interview manufacturers and distributors of water softeners and salts.

Develop target list of customers using self-regenerating water softeners, using the customer survey data base:

- ?? Includes 179 customers identified in 1998 and 1999 surveys as having water softeners
- ?? Includes 257 customers identified from 2000 and 2001 surveys as having the older less efficient water softeners
- ?? Add in 2002 data as it becomes available

Closely follow the key Irvine Ranch Water District project that is assessing the sources of salinity and the contribution of water softeners.

Develop and consider alternative program designs such as:

- ?? Consumer information on water, salt, and energy efficiency (low intervention end of the spectrum);
- ?? Rebate incentives for water- and salt-efficient units;
- ?? Collaborative program with softener industry marketing efforts;

- ?? Requirement for water- and salt-efficient units; and
- ?? Marketing materials for potassium chloride regeneration salts.

## Task 2: Design and Implement Pilot Program

Based on information collected in Task 1, a selected softener efficiency program will be designed in further detail and implemented. The database from the historical customer surveys will be used to develop a target list of those customers that have been identified as possessing and using the older inefficient timer-based water softeners. By targeting this program to the most inefficient devices, the effectiveness and cost-effectiveness of the program can be increased.

## Task 3: Evaluate Pilot Program.

The evaluation component of this program assesses costs, savings, and implementation effectiveness.

- ?? Savings Analysis. Determine savings from efficient or non-self-regenerating water softeners.
- ?? Implementation Analysis. Assess alternative program designs for implementing a program for residential water softener conservation.
- ?? Cost-Effectiveness Analysis. Compare costs to the water savings achievable with water softener conservation programs.
- ?? Cost data is maintained by implementing agency.
- ?? Savings can be assessed with billing histories, which are already maintained at the retail agencies.

## Task 4: Report and Dissemination.

Produce a draft and final report, including evaluation and program summaries. Allow adequate time for review and input from participating agencies and customers.

## Task 5: Coordination and Administration

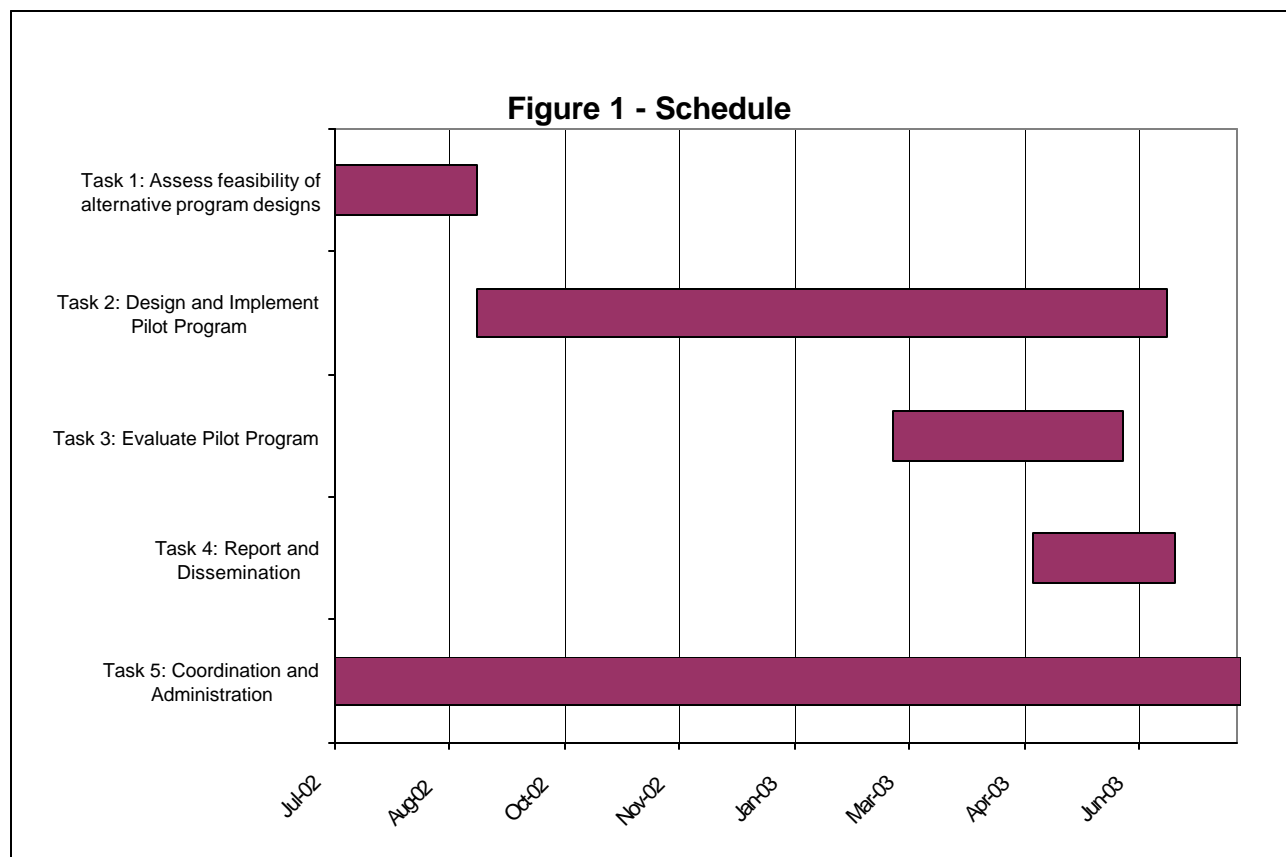
This task involves the coordination and administration of all program elements.

## Schedule

Table 1 and Figure 1 show likely milestones for project completion.

**Table 1 - Schedule**

Task	Start Date	Duration (Days)	End Date
Task 1: Assess feasibility of alternative program designs	1-Jul-2002	62	31-Aug-02
Task 2: Design and Implement Pilot Program	1-Sep-2002	300	27-Jun-03
Task 3: Evaluate Pilot Program	1-Mar-2003	100	8-Jun-03
Task 4: Report and Dissemination	1-May-2003	62	1-Jul-03
Task 5: Coordination and Administration	1-Jul-2002	394	29-Jul-03



### 3. Monitoring and Assessment

This program includes a focused evaluation component in the program to assess costs and savings, in keeping with SCVWD's IWRP. In particular:

- ?? Data from residential surveys is compiled in a database; for this project data fields can be added to record the type of water softeners replaced;
- ?? Cost data will be maintained by SCVWD;
- ?? Savings can be assessed with billing histories, which are already maintained at the retail agencies; and
- ?? A summary report and data will be available at the end of the evaluation.

### 4. Preliminary Plans and Specifications and Certification Statements

Not applicable.

## **C. *Qualifications of the Applicants, Cooperators, and Establishment of Partnerships***

### **1. Applicant Qualifications**

Resumes of key District staff participating in this project are attached to the back of this proposal.

### **2. Role of External Cooperators**

This projects as proposed in this grant application would be administered and conducted primarily by the Santa Clara Valley Water District. As a regional water wholesaler and groundwater agency, the SCVWD has strong reasons itself to investigate water softener programs. However, since the water and wastewater system is complex in the region, water softener technology has potential benefits across a number of agency jurisdictions. SCVWD expects to approach a number of potential beneficiary agencies as the project moves forward and to seek collaboration and coordination.

The general roles of the external cooperators will consist of the following:

- ?? Project direction and oversight
- ?? Funding support
- ?? Site location
- ?? Assessment of project costs and benefits from different agency perspectives: groundwater, wastewater, reclamation, wholesale and retail water supply.
- ?? Identify cost-effective opportunities for cooperation on additional programs where mutually beneficial.
- ?? Assessment of implementation barriers and opportunities at different agency perspectives.

Some of the potential beneficiaries and collaborators for this project include the following:

#### **a) San Jose / Santa Clara Water Pollution Control Plant**

The San Jose/Santa Clara Water Pollution Control Plant is a large advanced wastewater treatment plant that treats wastewater from over 1,500,000 people that live and work in the 300-square mile area encompassing San Jose, Santa Clara, Milpitas, Campbell, Cupertino, Los Gatos, Saratoga, and Monte Sereno. The Water Pollution Control Plant has the capacity to treat 167,000,000 gallons of wastewater per day.

b) City of Sunnyvale Water Pollution Control Plant

The facilities and services provided by the City of Sunnyvale Water Pollution Control Plant include:

- ?? Industrial Pretreatment
- ?? Water Reclamation
- ?? Water Conservation
- ?? Water Connections
- ?? Pollution Control Operations and Maintenance
- ?? Public Education

c) The Palo Alto Regional Water Quality Control Plant

The Palo Alto Regional Water Quality Control Plant treats wastewater from the East Palo Alto Sanitary District, Los Altos, Los Altos Hills, Mountain View, Palo Alto, and Stanford. The plant provides advanced treatment of wastewater, including primary, secondary, and tertiary treatment. The plant disinfects and filters two million gallons per day to meet California Code of Regulations, Title 22 standards for unrestricted reuse. Reuse expands the limited water supply in California and reduces plant discharge to the Bay. The water is used for irrigating golf courses, construction tanker trucks, and for a marsh that supports endangered species, migrant birds, and wildlife.

d) South County Regional Wastewater Authority

South County Regional Wastewater Authority is jointly owned by the Cities of Gilroy and Morgan Hill.

e) City of Mountain View Public Services Department (Water)

In addition to the wastewater and reclamation interests, as a water supplier the City of Mountain View has an interest in moving customers from inefficient water softeners as a demand management tool.

f) City of Sunnyvale Public Works Department (Water)

In addition to the wastewater and reclamation interests, as water supplier the City has an interest in moving customers from inefficient water softeners as a demand management tool.

## **D. Costs and Benefits**

### **1. Budget Breakdown and Justification**

Project costs to develop the water softener program are summarized in Table 2. The estimated total cost is \$103,927. District staff labor and overhead costs account for approximately 23% of this total. Outside evaluation consultants' labor to perform the process evaluation forms 10% of the total. Collaborating agencies staff labor amount to 8% of the total. The softener capital cost line item of \$60,000 derives from an estimate of 300 installations and \$200 for the average rebate cost. The following is a brief explanation of cost elements presented in Table 2.

*Salary and wages.* Average hourly rates for salaries and wages for District staff assigned to this project were derived from salary scales posted for the District's Water Use Efficiency and Information Technology units (<http://www.scvwd.dst.ca.us/fyi/classspec1.htm#fna>).

*Overhead.* Average hourly rates for benefits were developed from the District's standard benefits package, as posted at <http://www.scvwd.dst.ca.us/fyi/recuitpg1.htm>. Overhead rates are the same as used by the District for annual budget development.

Labor hours on the part of the lead agency and collaborating agencies cover all of the tasks in the project to a partial or full extent. The program development and implementation will require considerable staff time to complete because this type of program has not been implemented on this scale previously.

The evaluation budget includes resources for program assessment by a research consultant.

**Table 2: Budget for SCVWD Water Softener Pilot Program**

		SCVWD: Conservation Unit Manager		SCVWD: Conservation Specialist 1		SCVWD: Conservation Specialist 2		Total				
Task	Hours	\$52.38/hr.		Hours	\$31.66/hr.		Hours	\$34.95/hr.		Hours	\$/Task	
Task 1: Assess feasibility of alternative program designs	8	\$	419	16	\$	507	16	\$	559	40	\$	1,485
Task 2: Design and Implement Pilot Program	24	\$	1,257	48	\$	1,520	48	\$	1,678	120	\$	4,454
Task 3: Evaluate Pilot Program	2	\$	105	4	\$	127	4	\$	140	10	\$	371
Task 4: Report and Dissemination	12	\$	629	24	\$	760	24	\$	839	60	\$	2,227
Task 5: Coordination and Administration	16	\$	838	32	\$	1,013	32	\$	1,118	80	\$	2,970
Total	62	\$	3,248	124	\$	3,926	124	\$	4,334	310	\$	11,507
		Collaborating Agencies: Conservation Unit Manager		Collaborating Agencies: Conservation Specialist 1		Collaborating Agencies: Conservation Specialist 2		Total				
Task	Hours	\$52.38/hr.		Hours	\$31.66/hr.		Hours	\$34.95/hr.		Hours	\$/Task	
Task 1: Assess feasibility of alternative program designs	-	\$	-	-	\$	-	-	\$	-	-	\$	-
Task 2: Design and Implement Pilot Program	8	\$	419	16	\$	507	16	\$	559	40	\$	1,485
Task 3: Evaluate Pilot Program	2	\$	105	4	\$	127	4	\$	140	10	\$	371
Task 4: Report and Dissemination	5	\$	251	10	\$	304	10	\$	336	24	\$	891
Task 5: Coordination and Administration	8	\$	419	16	\$	507	16	\$	559	40	\$	1,485
Total	23	\$	1,194	46	\$	1,444	46	\$	1,594	114	\$	4,232
		Evaluation Contractor						Total				
Task	Hours	\$100/hr.						Hours	\$/Task			
Task 1: Assess feasibility of alternative program designs	-	\$	-					-	\$	-		
Task 2: Design and Implement Pilot Program	20	\$	2,000					20	\$	2,000		
Task 3: Evaluate Pilot Program	80	\$	8,000					80	\$	8,000		
Task 4: Report and Dissemination	-	\$	-					-	\$	-		
Task 5: Coordination and Administration	-	\$	-					-	\$	-		
Total	100	\$	10,000					100	\$	10,000		

Summary	SCVWD	Collaborating Agencies	Evaluation Contractor	
Raw Labor	\$ 11,507	\$ 4,232	\$ 10,000	\$ 25,739
Overhead (@106.03%)*	12,201	4,487	included	16,688
Local Travel and Transportation	\$ 500	\$ 500	\$ 500	\$ 1,500
Softener Costs	\$ 60,000		\$ -	\$ 60,000
Total Project Costs	\$ 84,208	\$ 9,219	\$ 10,500	\$ 103,927
Participant Agency Costs	\$ 24,208	\$ 9,219	\$ 10,500	\$ 43,927
Requested Grant Funding	\$ 60,000	\$ -	\$ -	\$ 60,000

\*FY 1999-2000 SCVWD's Federal Office of Management & Budget (OMB) Circular A-87 Overhead Rate (Will use current rate for Actual Claim)

## 2. Cost Sharing

As proposed in this grant applications, the project would be co-funded exclusively by the SCVWD. However, since the implementation of the project will be in cooperation with other beneficiary agencies, we expect cost sharing arrangements to develop.

## 3. Benefit Summary and Breakdown

The project outcomes include the following physical results:

- ?? Old water softeners will be replaced, resulting in a reduction in demand for water, including water imported from the Bay-Delta to urban water agencies;
- ?? The new softeners will reduce the introduction of TDS, detergents, and other cleaning compounds into wastewater flows and potentially to ground and surface water supplies that are part of the Bay-Delta ecosystem.
- ?? Filter systems that replace softeners will eliminate regeneration water consumption and any introduction of TDS or other compounds into the wastewater stream.
- ?? Off-site central plant regeneration will eliminate regeneration water consumption and any introduction of TDS or other compounds into the wastewater stream at the residential site and replace it at the central plant. Central plant operations tend to have scale economies in production and current technology.
- ?? New water softeners are also more energy efficient, saving the Bay-Delta ecosystem an increment of environmental damage resulting from energy production and distribution.
- ?? The experience learned from this program will result later in more cost-effective programs in the future to reduce TDS and other contaminants.
- ?? The experience will allow the collection of information on the most cost-effective means to maximizing point-of-use water softener efficiency—such as device settings to optimize efficiency for local water quality conditions and plumbing configuration.
- ?? Customers will see reduced water, salt, and energy bills, and potentially reduced wastewater bills if they are tied to water consumption.

### a) Quantified Project Outcomes And Benefits

Quantified benefits include:

- ?? Water savings;
- ?? Wastewater volume savings; and
- ?? Wastewater reduction in TDS

Water savings accrued from the proposed program derive from three potential outcomes: 1) Replacement of old water conditioners with high efficiency models; 2) replacement of old water

conditioners with water filters; or 3) replacement of old water conditioners with off-site regeneration services.

The water savings benefits will occur on a year round basis, contributing fully to the reduction of peak season demand.

The benefits quantified in this grant will accrue to water and wastewater agencies.

#### b) Non-Quantified Project Outcomes and Benefits

Benefits and outcomes that are not quantified or not fully quantified include the following:

- ?? Reduced demand for water imported from the Bay-Delta. This grant application does not quantify the specific share of imported and local water.
- ?? Reduced demand on groundwater resources. This includes both less demand pressure and less potential for introduction of TDS into groundwater due to reduced TDS in wastewater inflows.
- ?? Reduced TDS load into wastewater system (not fully quantified)
- ?? Reduced amount of detergents and cleaning agents into wastewater system
- ?? Managed demand for reclaimed water
- ?? Reduced water cost (on average)
- ?? Reduced energy bills and reduced water heater repairs

#### 4. Assessment of Costs and Benefits

Table 3 summarizes the quantified costs and benefits of the project as proposed in this grant application. The major assumptions are described in what follows.

##### a) List of Major Assumptions

Assumptions used to calculate expected savings include:

?? Base use per person	75gpd
?? Persons per household (SF)	4
?? Gallons per regeneration (old softener)	20
?? Gallons per regeneration (new softener)	9
?? Gallons flow between recharge (256 ppm, 15 grains/gal)	300
?? Days per week @ 300 gpd use on average	4
?? Percent replacements with filter or off-site recharge	50%

With these assumptions, the expected savings are 17.4 gallons per day per replacement.

**Table 3: Cost Benefit Analysis (\$2001)**

Year	Costs	Savings (gpd/ device)	Savings AFY all devices	Supply Benefits (\$/AF)	Wastewater Benefits (\$/AF)	All Agency Benefits (\$)	PV Costs	PV Benefits	Annual NPV	Annual NPV
0	\$ 103,927	0.0	-	\$ 1,000	\$ 500	\$ -	\$103,927	\$ -	\$ (103,927)	\$ (103,927)
1	\$ -	17.4	5.86	\$ 1,020	\$ 510	\$ 8,967	\$ -	\$ 8,459	\$ 8,459	\$ (95,467)
2	\$ -	17.4	5.86	\$ 1,040	\$ 520	\$ 9,146	\$ -	\$ 8,140	\$ 8,140	\$ (87,327)
3	\$ -	17.4	5.86	\$ 1,061	\$ 531	\$ 9,329	\$ -	\$ 7,833	\$ 7,833	\$ (79,494)
4	\$ -	17.4	5.86	\$ 1,082	\$ 541	\$ 9,516	\$ -	\$ 7,537	\$ 7,537	\$ (71,957)
5	\$ -	17.4	5.86	\$ 1,104	\$ 552	\$ 9,706	\$ -	\$ 7,253	\$ 7,253	\$ (64,704)
6	\$ -	17.4	5.86	\$ 1,126	\$ 563	\$ 9,900	\$ -	\$ 6,979	\$ 6,979	\$ (57,725)
7	\$ -	17.4	5.86	\$ 1,149	\$ 574	\$ 10,098	\$ -	\$ 6,716	\$ 6,716	\$ (51,009)
8	\$ -	17.4	5.86	\$ 1,172	\$ 586	\$ 10,300	\$ -	\$ 6,462	\$ 6,462	\$ (44,546)
9	\$ -	17.4	5.86	\$ 1,195	\$ 598	\$ 10,506	\$ -	\$ 6,219	\$ 6,219	\$ (38,327)
10	\$ -	17.4	5.86	\$ 1,219	\$ 609	\$ 10,716	\$ -	\$ 5,984	\$ 5,984	\$ (32,344)
11	\$ -	17.4	5.86	\$ 1,243	\$ 622	\$ 10,931	\$ -	\$ 5,758	\$ 5,758	\$ (26,585)
12	\$ -	17.4	5.86	\$ 1,268	\$ 634	\$ 11,149	\$ -	\$ 5,541	\$ 5,541	\$ (21,045)
13	\$ -	17.4	5.86	\$ 1,294	\$ 647	\$ 11,372	\$ -	\$ 5,332	\$ 5,332	\$ (15,713)
14	\$ -	17.4	5.86	\$ 1,319	\$ 660	\$ 11,600	\$ -	\$ 5,131	\$ 5,131	\$ (10,582)
15	\$ -	17.4	5.86	\$ 1,346	\$ 673	\$ 11,832	\$ -	\$ 4,937	\$ 4,937	\$ (5,645)
16	\$ -	17.4	5.86	\$ 1,373	\$ 686	\$ 12,068	\$ -	\$ 4,751	\$ 4,751	\$ (895)
17	\$ -	17.4	5.86	\$ 1,400	\$ 700	\$ 12,310	\$ -	\$ 4,571	\$ 4,571	\$ 3,677
18	\$ -	17.4	5.86	\$ 1,428	\$ 714	\$ 12,556	\$ -	\$ 4,399	\$ 4,399	\$ 8,076
19	\$ -	17.4	5.86	\$ 1,457	\$ 728	\$ 12,807	\$ -	\$ 4,233	\$ 4,233	\$ 12,309
20	\$ -	17.4	5.86	\$ 1,486	\$ 743	\$ 13,063	\$ -	\$ 4,073	\$ 4,073	\$ 16,382
			117.22				\$103,927	\$ 120,309	\$ 16,382	

Assumptions for program benefits include the following:

- ?? 300 softeners are replaced in the program
- ?? The cost to the agency is \$200 on average (average rebate for high efficiency softener, filter or off-site regeneration).
- ?? Avoided water supply and distribution costs of \$1,000 per acre-foot, based on a high cost supply option in the IRP.
- ?? Avoided wastewater treatment costs of \$500 per acre-foot.
- ?? All dollar values are in real (inflation adjusted) Year 2001 dollars.
- ?? Real (inflation adjusted) escalation in water supply costs of 2% per year.
- ?? Real (inflation adjusted) escalation in waste water supply costs of 2% per year.
- ?? Discount rate of 6% as specified in the proposal.<sup>1</sup>
- ?? 20-year life span and period of analysis.

b) Table with Quantified Costs and Benefits

Table 3 includes costs and benefits to CALFED and to the applicant agency. Customer costs and benefits are not included, although one could interpret the CALFED perspective to include customers. Since the applicant has not completed the identification of the specific collaborators for this project, we simply list the following potential perspectives of analysis:

CALFED (Regional and State) Perspective  
Water Agency Perspectives  
Wastewater Agency Perspectives  
Groundwater Agency Perspectives  
Customer Perspectives

c) Table with Non-Quantified Costs and Benefits

Table 4 summarizes the non-quantified or not-fully-quantified costs and benefits by perspective.

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<sup>1</sup> We used a 6% discount rate as required; however, it is not clear in the solicitation whether the intent is to discount with 6% real or nominal. Since all other costs are specified to be in real terms, it would be consistent to interpret the 6% as real, or the rough equivalent to 9% nominal at 3% inflation.

**Table 4 - Costs and Benefits by Perspective of Analysis**

<b>Perspective</b>	<b>Costs</b>	<b>Benefits</b>
<b>CALFED</b>	<ul style="list-style-type: none"> <li>* Staff Labor: Program Design, Implementation, Outreach (WH &amp; W)</li> <li>* Installation costs (W)</li> <li>* Evaluation Contractor (WH)</li> <li>* Meter costs (Grant)</li> </ul>	<ul style="list-style-type: none"> <li>* Avoided Costs of Supply, Distribution, Treatment (WH &amp; W)</li> <li>* Avoided Dry Season Runoff Mitigation (WW)</li> <li>* Reduced Hardscape Damage (C &amp; City Street Dept)</li> <li>* Improved Emergency Management (WH&amp;W)</li> <li>* Improved Drought Response (WH&amp;W)</li> <li>* Improved Maintenance Management (WH&amp;W)</li> <li>* Environmental Benefit: Beach Recreation &amp; Public Health (Bay Delta)</li> <li>* Environmental Benefit: Waterway &amp; Ocean Ecosystem (Bay Delta)</li> <li>* Improved Landscape Esthetics &amp; Reduced Replacements (C)</li> </ul>
<b>WholesaleWater Agency (Implementing Agency)</b>	<ul style="list-style-type: none"> <li>* Staff Labor: Program Design, Implementation, Outreach (WH)</li> <li>* Evaluation Contractor (WH)</li> </ul>	<ul style="list-style-type: none"> <li>* Avoided Costs of Supply, Distribution, Treatment (WH)</li> <li>* Improved Emergency Management (WH)</li> <li>* Improved Drought Response (WH)</li> <li>* Improved Maintenance Management (WH)</li> </ul>
<b>Retail Water Agency (Collaborating Agency)</b>	<ul style="list-style-type: none"> <li>* Staff Labor: Program Design, Implementation, Outreach (W)</li> <li>* Installation Costs (W)</li> </ul>	<ul style="list-style-type: none"> <li>* Avoided Costs of Supply, Distribution, Treatment (W)</li> <li>* Improved Emergency Management (W)</li> <li>* Improved Drought Response (W)</li> <li>* Improved Maintenance Management (W)</li> </ul>
<b>Wastewater Agency</b>	<ul style="list-style-type: none"> <li>* Cost share if applicable.</li> </ul>	<ul style="list-style-type: none"> <li>* Reduced infiltration and inflow (WW)</li> <li>* Avoided Dry Season Runoff Mitigation (WW)</li> </ul>
Notes: Cost and benefit incidence indicated as WH = wholesale agency, W = water agency, WW = wastewater agency, and C = customer		

d) Demonstration of Local Cost Effectiveness

Table 3 is the demonstration of local cost-effectiveness. The table shows that the present value of benefits exceeds the present value of costs.<sup>2</sup>

<sup>2</sup> It is not explicit from the grant specifications if by locally cost-effective the project costs and benefits should include customer costs and benefits.

## ***E. Outreach, Community Involvement, and Acceptance***

### **1. Outreach Efforts to Contact and Involve Disadvantaged Communities**

The program will test target multi-family sites with low-income residents and consider ways to reduce water costs to low-income residents.

### **2. Training, Employment, and Capacity Building Potential**

Most of the training, employment, and capacity building potential of this project is from the vendors and contractors that install and service the equipment.

### **3. Customer and Community Acceptance**

This program has been crafted to first reach out to customers that have voluntarily agreed to participate in one of the customer surveys. It is expected that this program will have a good level of acceptance among this group.

### **4. Information Dissemination**

The status of the program and its evaluation results will be communicated:

- ?? To water, wastewater, and groundwater agencies;
- ?? To water softener and filter suppliers and vendors;
- ?? To customers and the general public; and
- ?? To advocacy organizations.

### **5. Evaluation, Feedback, and Revision**

The project will include an integrated program evaluation to assess program costs, benefits, and process effectiveness. The evaluation will analyze and assess lessons learned, and summarize the results in a report.

## ***F. Resumes of Key Personnel***

Attached are resumes for the following project managers and key staff:

## **KAREN MORVAY**

### **Santa Clara Valley Water District**

#### **EDUCATION**

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May 1994 Master of Science in Environmental Studies	<b>San Jose State University</b>	San Jose, CA
June 1990 Bachelor of Arts in Political Science	<b>University of California at Santa Cruz</b>	Santa Cruz, CA

#### **WORK EXPERIENCE**

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September 2000 to Present Water Conservation Specialist	<b>Santa Clara Valley Water District</b>	San Jose, CA
1998 to 2000 Project Assistant	<b>Santa Clara Valley Water District</b>	San Jose, CA
1997 to 1998 Public Affairs Manager	<b>GreenTeam of San Jose</b>	San Jose, CA
1994 to 1997 Hazardous Materials Technician	<b>Santa Clara County</b>	San Jose, CA
1993 to 1994 Recycling Program Assistant	<b>City of Mountain View</b>	Mtn.View, CA
1990 to 1991 Recycling Program Intern	<b>City of Seattle, Solid Waste Utility</b>	Seattle, WA
1989 to 1990 Water Conservation Coordinator	<b>University of California at Santa Cruz</b>	Santa Cruz, CA

#### **CERTIFICATES**

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?? 1994	OSHA 40-hour Hazardous Waste Management Certificate
?? 2000	American Red Cross Advanced Adult CPR and First Aid
?? 2002	American Water Works Association, Water Conservation Practitioner

**HOSSEIN ASHKTORAB**  
Santa Clara Valley Water District

**EDUCATION:**

**Ph.D.**, University of California, Davis, 1989. Plant, Soil and Water Science.  
**Master of Science**, California State University, Chico, 1981. Irrigation  
**Bachelor of Science**, University of Mazandaran, 1979. Agriculture Engineering.

**PROFESIONAL EXPERIENCE:**

**Unit Manager, Water Use Efficiency Unit, Santa Clara Valley Water District 1/01 to Present**

Responsible for managing the District Water Use Efficiency Unit (WUE) providing technical direction, coordinating its activities with other District Units, and external stakeholders including 13 water retailers. The water conservation program is a long-term commitment of the District, which provides the highest quality programs and educational opportunities to residents and businesses in Santa Clara County.

Managing the implementation of all 14 BMPs required by the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU). In addition, Managing the adopted Water Conservation Plan (including agriculture water conservation program) to comply with US Bureau of Reclamation mandate as required by the Central Valley Project Improvement Act (CVPIA).

Manage and participate in the development, implementation and administration of the water conservation and water recycling programs with more than \$9 million annual budget in Santa Clara County.

Develop partnership with local and regional cities including various water conservation programs with City of San Jose with more than \$3 million cost-sharing budget as well as cost-sharing agreement with six other agencies in Northern California for residential efficient clothes washing machine.

Participate and engage in the recycled water partnership such as South Bay Water Recycling cost sharing agreement for the amount of \$50 million projects in the Santa Clara County.

Participate and coordinate with local, regional and statewide water conservation and recycling organizations. Member of CUWA water conservation committee and CUWCC steering, plenary, Program committees and several subcommittees.

**Water Conservation Specialist, Water Use Efficiency Unit, Santa Clara Valley Water District 1/97 to 1/01**

Developed and managed water conservation programs including programs for agricultural and large landscape water users.

Technical staff to District Landscape Water Advisory Committee, and District Agriculture Water Advisory Committee.

Responsible for implementation of CALFED grants for the District Agricultural and Urban Water Use efficiency programs. Developed proposals and received grant fund for two District's water recycling projects from Proposition-13 grant funding.

In partnership with the Santa Clara Farm Bureau, UC Cooperation Extension, Department of Agriculture, Department of Water Resources, and Santa Clara County Natural Resource Conservation Service, Developed and conducted nine Agricultural Irrigation and Nutrient Management seminars for the County growers and interested groups

**Associate Land Water Use Analyst, California Department of Water Resources, 12/86 to 9/93**

Technical coordinator for the Assembly Bill 325 Task Force Advisory Committee in 1991 and 1992 and facilitated the development of the State Landscape Water Conservation Model Ordinance. Assisted water agencies, cities and counties to develop and implement landscape water conservation guidelines and ordinances.

As a member of the State Water Conservation Advisory Committee, participated in the development of the Best Management Practices (BMPs) in water conservation.

Participated in the negotiation with the agricultural stakeholders and U.S. Bureau of Reclamation for the State Department of Water Resources Drought Water Bank. Developed a new method using nonlinear regression model to estimate crop water requirement values for major crops in the Delta's agricultural area which was the bases for the negotiation of the irrigation water use.

Supported agencies in the development of their water management plan, implementation and evaluation of various water conservation programs such as the ULF toilet replacement, toilet displacement devices, low flow shower heads and outdoor water audits.

Member of the 1989 and 1992 Xeriscape Conferences Steering Committee and chaired the Award Subcommittee meetings.

**Irrigation Consultant, Chico, California, 2/80 to 9/81**

Designed irrigation system and developed irrigation management plan for various farmers including a large fruit orchard located in Chico.

**RESEARCH AND TEACHING EXPERIENCE:**

**Assistant Professor, Dept. of Irrigation Eng., Shiraz University, 9/93 to 6/96**

Lectured on urban water use and conservation, crop water requirements, evapotranspiration and irrigation systems and design. Directed related laboratories and field trips.

**Research Assistant professor, University of California, Davis, 6/96 to 12/97**

Crop water requirement and water management. 3-D Aerodynamic latent heat flux research studies Field research study on irrigation system and evaluation.

**Research Assistant, University of California, Davis, 9/81 to 5/82 and 4/83 to 12/86**

Field laboratory investigations related to the separation of soil evaporation and transpiration of tomato plants. Studied the evaporation rate under different plant growth stages and soil moisture contents using highly sensitive Lysimeter. Collected and interpreted weather station data at U.C. Davis field station. Worked extensively with instruments, soil moisture and particle size analysis. Engaged in field and greenhouse studies related to root elongation, density, and plant response under different drip irrigation regimes and fertilizer applications

**CERTIFICATION:**

Irrigation Systems Evaluation; Landscape Irrigation Master Auditor

**PROFESSIONAL MEMBERSHIP:**

American Society of Civil Engineers; Irrigation Association; American Water Works Association; WateReuse Association